

Effect of Iodine on the Floatability of Sulfide Minerals SOV/20-127-2-41/70

The following course is assumed: iodine adheres on the mineral surface, it oxidizes xanthogenate to produce dixanthogenide, and this in turn adheres on the sulfide minerals. Iodine acts as collector. Slight iodine additions are sufficient to intensify the floatability of sulfide minerals. There are 3 tables and 1 reference.

SUBMITTED: April 27, 1959

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5 (1)

AUTHORS:

Plaksin, I. N., Corresponding Member  
AS USSR, Shafeyev, R. Sh.

SOV/20-128-4-39/65

TITLE:

On the Problem of the Quantitative Estimation of the Xanthate  
Stay in Dependence on the Surface Properties of Sulfide  
Minerals

PERIODICAL:

Doklady Akademii nauk SSSR, 1959, Vol 128, Nr 4, pp 777 - 780  
(USSR)

ABSTRACT:

The spot-like distribution of the flotation reagents on the surface of mineral particles of the flotation pulp is partly caused by the electrochemical heterogeneity (Refs 1-3). In the present paper the authors give some experimental results there-to. They measured the gradient of the electric fields between the surface sections of the sulfides which had different electrochemical potentials. For this purpose the authors used the cathodic polarization of the minerals in 0.01 n copper sulfate or silver nitrate solution (method see Ref 4). For this purpose the separation boundaries of the cathode metal were determined at a periodic change of the polarization change in the negative direction. It was proved by many experiments that the gradient of the electric fields between the individual sur-

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of Sulfide Minerals

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face sections of galenite amounts to approximately 400-500 mv. This agrees with the measured values of the electrochemical potential of different galenite samples. Figure 1 shows the topography of the potential distribution on the galenite surface determined by the method described in  $\text{CuSO}_4$  at a voltage change within 1 minute. Furthermore, it was found that various impurities and fine mud particles clinging to the facets of the sulfide minerals contribute towards the inequipotentiality of the sulfide surface. A local micro-galvanic element exists here. The specificity of the sulfide minerals as typical semiconductor must not be neglected. The main impurities in natural galenite are lead- or sulphur atoms, the latter in excess. The following formula of the sulfides is therefore more correct:  $\text{Me}_{1-x}\text{S}_x$ , x denoting the sulphur content in the sulfide, expressed in fractions of one. x amounts for PbS in a stoichiometric composition to 0.145. If the lead atoms are in excess, galenite tends towards an electron conductivity, if sulphur atoms are in excess, galenite has the tendency to have a

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hole-conductivity. Figure 2 shows a scheme of the formation of an electrochemical spot on the galenite surface in consequence of the change of the stoichiometric composition of the mineral. The electrochemical processes on the surface of the minerals are very complicated and extensive. A formation of dixanthogenide in the xanthate flotation of the sulfide minerals (especially of the copper-bearing ones) occurred several times. The formation of dixanthogenide on the anode in the electrolysis is known as well (Ref 8). The authors confirmed this in the electrolysis of 10 ml of the 0.01 n-xanthate solutions. The electrochemical factor is very important in the interaction between sulfide minerals and xanthates. Therefrom follows the part played by the inner electrolysis which results from the contact in the collision of the sulfide mineral particles with different electrochemical potentials. By this electrochemical system xanthate can be additionally oxidized into dixanthogenide. The dixanthogenide formed on the particle surface may shift to more hydrophobe spots of the mineral surface as well as to other

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particles in the pulp when they collide. There are 3 figures and 8 references, 6 of which are Soviet.

SUBMITTED: June 19, 1959

Card 4/4

DUDENKOV, S.V.; LIVSHITS, A.K.; SHAFEYEV, R.Sh.

New method of characterizing the dispersion of air in solutions  
of frothing reagents. Sbor.nauch.trud.GINTSVETMET no.16:89-101  
'59. (MIRA 14:4)

(Flotation—Equipment and supplies)





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Card  
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SUBMITTED: December 4, 1959



S/020/60/135/001/027/030  
B016/B067

AUTHORS: Plaksin, I. N., Corresponding Member/AS USSR, Shafeyev,  
R. Sh.

TITLE: Characteristics of the Hydrophobing Effect of Oxygen on  
the Surface of Sulfide Minerals

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 135, No. 1, pp.140-142

TEXT: In earlier papers (Refs. 1-3), the authors found that the xanthogenate is not fixed on a freshly uncovered surface of the sulfides. The surface must be previously treated with oxygen. Theoretically, this has been little investigated. In the present paper, the authors studied the effect of oxygen on the hydrophobing of the sulfide minerals by xanthogenate by taking special account of the semiconductor properties on the surface of the minerals. Galenite was used for the investigations because it is a typical semiconductor of the combined type. On the basis of radio-graphic studies, the authors observed that the xanthogenate is very irregularly distributed over the galenite particles. In processing freshly crushed

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of Oxygen on the Surface of Sulfide Minerals B016/B067

galenite particles with potassium butyl xanthogenate which contained the radioactive isotope  $S^{35}$ , always three particle groups were distinguished: a) particles which were completely covered with xanthogenate, b) particles which were irregularly covered with xanthogenate like a mosaic, c) particles with practically no xanthogenate on their surface (Fig. 1). The different behavior of the galenite particles as compared to the xanthogenate anions is explained by the different semiconductor properties of the galenite surface. The action of oxygen which is adsorbed on the mineral surface eliminates this difference. Natural samples of freshly uncovered galenite had, in most cases, n-type conductivity. To examine the thesis that the xanthogenate on the surface of n-type galenite is not fixed, some experiments were made. Fig. 2 shows the radiograph of a galenite particle to which xanthogenate anions were fixed only in the lower part which was previously treated with oxygen. The experimental results confirmed the correctness of the above thesis. The fixing of xanthogenate starts only after the surface of the mineral had been transformed into a p-type semiconductor. This transformation takes place when the concentration of the oxygen molecules or other oxidizers on the surface of the galenite is

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sufficiently high. A state of the surface at which the Fermi level corresponds to the Fermi level of the own conductivity of the mineral or of that region which contains a minimum amount of electrons and holes proved to be most suitable for the floatability of the galenite particles. The transition from n-type to p-type proceeds irregularly on the mineral surface. Regions are formed with n-type conductivity and regions with p-type conductivity which, on their part, cause an irregular distribution of the xanthogenate between the galenite particles and the surface of the individual particles. The oxygen shortage reduces the floatability of the sulfides, an excess may cause unexpected phenomena. To attain optimum conditions of flotation, the oxygen or other oxidizers must be conditioned in the liquid phase. There are 2 figures and 9 references: 7 Soviet, 1 US, and 1 Dutch.

ASSOCIATION: Institut gornogo dela Akademii nauk SSSR  
(Mining Institute of the Academy of Sciences, USSR)

SUBMITTED: July 16, 1960

Card 3/3

PLAKSIN, I.N.; SHAFEYEV, R.Sh.

Influence of the size of galena particles on the fixation of  
flotation collector reagents. Dokl. AN SSSR 142 no.1:131-133  
Ja '62. (MIRA 14:12)

1. Chlen-korrespondent AN SSSR (for Plaksin).  
(Galena) (Flotation)

SHAFIYEV, R.Sh., kand.tekhn.nauk; SHRADER, E.A., inzh.

Measuring the oxidation-reduction potential of ethyl xanthate  
by the polarographic method. Nauch. soob. IGD 16:88-93 '62.  
(MIRA 16:8)

(Polarography) (Oxidation-reduction reaction)  
(Flotation—Equipment and supplies)

KAYFOROV, T.I.; POL'KIN, S.I.; SHAFEYEV, R.Sh.

State of a double electric layer of tantalite and certain accompanying minerals during flotation. Izv. vys. ucheb. zav.; tsvet. met. 6 no.3:40-46 '63. (MIRA 16:9)

1. Moskovskiy institut stali i splavov, kafedra obogashcheniya rud redkikh metallov.

(Tantalite—Electric properties)  
(Flotation)

POL'KIN. S.I. (Moskva); NAYFONOV, T.B. (Moskva); SHAFEYEV, R.Sh. (Moskva)

Studying the electrochemical properties of tantalite surface  
during its interaction with certain flotation reagents. Izv.  
AN SSSR. Otd. tekhn. nauk. Met. i gor. delo no.2:169-172 Mr-Ap '63.  
(MIRA 16:10)



PLAKSIN, I.N.; SHAFEYEV, R.Sh.; CHANTURIYA, V.A.

Electrochemical surface properties of ilmenite, rutile,  
and ilmenorutile as interrelated with their flotation  
characteristics. Dokl. AN SSSR 152 no.6:1405-1407 O '63.  
(MIRA 16:11)

1. Institut gornogo dela im. A.A. Skochinskogo. 2. Chlen-  
korrespondent AN SSSR (for Plaksin).

SHAFIYEV, R.Sh., kand.tekhn.nauk

Effect of electrochemical surface processes on the distribution  
of xanthate on the surface of sulfide minerals. Nauch. soob. IGD  
19:53-58 '63. (MIRA 17:2)

PLAKSIN, Igor' Nikolayevich; SHAFEYEV, Rafael' Sharifovich;  
CHANTURIYA, Valentin Alekseyevich; VASIL'YEV, B.K., red.

[Effect of the surface heterogeneity of minerals on their  
interaction with flotation reagents] Vliianie geterogen-  
nosti poverkhnosti mineralov na vzaimodeistvie s flotatsion-  
nymi reagentami. Moskva, Nauka, 1965. 49 p.  
(MIRA 18:4)

И. И. Давыдов, В. И. Давыдов. (Москва); ШАНТОНОВА, В. И. (Москва)

Influence of halogen anions on the state of the emulsion of  
oleic acid under flotation conditions. Izv. AN SSSR. Met. i gor.  
delo no.6:186-187. 1964. (MIRA 18:3)

PLAKSIN, I.N.; SHAFEYEV, R.Sh.; CHANTURIYA, V.A.

Characteristics of the fixing of oxygen treated oleic acid  
on the surface of rutile and zircon. Izv. vys. ucheb. zav.;  
tsvet. met. 8 no.1:18-20 '65. (MIRA 18:6)

1. Institut gornogo dela imeni Skochinskogo.

L 26109-66 EWT(1)  
ACC NR: AP6015093

SOURCE CODE: UR/0020/66/168/001/0152/0153

AUTHOR: Plaksin, I. N. (Corresponding member, AN SSSR); Bruns, S. A.; Chanturiya, V. A.; Shafeyev, R. Sh. 42  
B

ORG: none

TITLE: The influence of the frequency of an electric field on the optical and structural properties of water

SOURCE: AN SSSR. Doklady, v. 168, no. 1, 1966, 152-153

TOPIC TAGS: electric effect, electric field, irradiation effect, irradiation intensity

ABSTRACT: The experiments were performed to study the effect of electric field frequency on the intensity of light extinction caused by water. The test tubes used had a capacity of 25 cubic centimeters. Two electrodes made of brass foil were fixed to the tube from the outside. A GSS-6 standard signal generator was used for irradiation. The frequency of the current was varied from 100 kcps to 26 Mcps. Duration of irradiation was 30 min. The intensity of extinction was measured on a special installation consisting of a UM-2 universal monochromator, an excitation source (a 12-volt incandescent lamp), and an FEU-29 photomultiplier. The photocurrent of the photomultiplier was recorded by a sensitive galvanometer. The monochromator could determine extinction intensity caused by water within a range from 380 Z

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UDC: 546.212

L 26109-66

ACC NR: AP6015093

to 691 mμ. Measurements were made of the spectral distribution of transmission intensity of light through an empty vessel and a vessel filled with water. The difference between these intensities gives the intensity of the light extinction caused by the water. The dependence of the extinction intensity on the electric field intensity was of two types. In the frequency range from 100 kcps to 8 Mcps in some cases a decrease in extinction intensity with regard to the untreated water was observed while in other cases an increase in extinction intensity was observed. The double character of the dependence of light extinction can be attributed to the superimposition of the influence of the electric field on the effects of different external fields present in the water which are caused by solar radiation, radiowaves, and other external electromagnetic fields. The change in the light extinction caused by the water can result from either the change in light absorption or the change in light dispersion. In both cases the structural conditions of the water are changed. Electric fields of various frequencies cause the structure of the water to change through a disturbance of the natural oscillation frequency of the water's molecules. [JA]

Orig. art. has: 1 figure.

SUB CODE: 20/ SUBM DATE: 23Nov65/ OTH REF: 002/ ATD PRESS: 4153

Card 2/2 CC



ACC NR: AP6019534

(A)

SOURCE CODE: UR/0020/66/168/004/0864/0866

AUTHOR: Plaksin, I. N. (Corresponding member AN SSSR); Shafeyev, R. Sh.; Chanturiya, V. A.

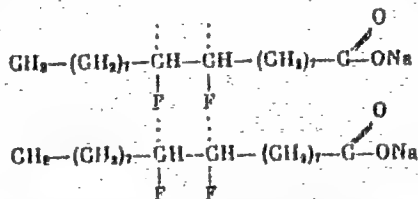
ORG: Mining Institute im. A. A. Skochinskiy (Institut gornogo dela)

TITLE: Nature of interaction between sodium fluoride and oleic acid during floatation separation of titanium and zirconium ores

SOURCE: AN SSSR. Doklady, v. 168, no. 4, 1966, 864-866

TOPIC TAGS: IR spectrum, sodium compound, titanium oxide, zirconium compound, floatation, oleic acid

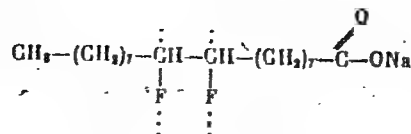
ABSTRACT: A method of separating zirconium and titanium ores by means of selective precipitation of zirconium oxide from the mixed ores during floatation is described. The method is based on the selective reaction of sodium fluoride with oleic acid absorbed on zirconium oxide resulting in the formation of an organic polyfluoride



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UDC: 547.397

ACC NR: AP6019534



which then precipitates. The zirconium oxide is recovered from the precipitate by treatment with concentrated  $\text{H}_2\text{SO}_4$  at  $\text{pH}=2-3$ . The optimum quantity of sodium fluoride was found to be equal to 250-300 grams per ton of mixed ore. By this procedure, one obtains a titanium concentrate containing 84.9%  $\text{TiO}_2$  and a zirconium concentrate containing 62.0%  $\text{ZrO}_2$ . It is suggested that the method can be employed generally in the separation of nonsulfide type ores. The IR spectra of the oleic acid on mineral surfaces before and after treatment with sodium fluoride are given. Orig. art. has: 2 figures, 1 formula.

SUB CODE: 07,11/

SUBM DATE: 09Nov65/

ORIG REF: 003/

OTH REF: 001

Card 2/2

SHAFIYEVA, D.R.

Study of the critical case of two zero roots with one group  
of solutions to denumerable systems of differential equations.  
Izv. AN Kazakh. SSR. Ser. fiz.-mat. nauk 3 no. 3:92-94  
S-D '65. (MIRA 18:12)

SHAFEYEVA, K.

All-Union Conference on the Use of Solar Energy. *Geliotekhnika*  
no.6:39-41 '65. (MIRA 19:1)

MARKMAN, A.L., doktor khim. nauk, otv. red.; KISELEVA, V.N., red.; SOKOLOVA, A.A., red.; SHAFEYEVA, K.A., red.; GOR'KOVAYA, Z.P., tekhn.red.

[Problems of utilizing the mineral and vegetable raw materials of Central Asia] Voprosy ispol'zovaniia mineral'nogo i rastitel'nogo syr'ia Srednei Azii. Tashkent, 1961. 194 p. (MIRA 15:7)

1. Akademiya nauk Uzbekskoy SSR, Tashkent Otdeleniye geologo-khimicheskikh nauk.

(Uzbekistan---Chemistry, Technical)

FILATOV, Aleksandr Nikolayevich; ARZHANYKH, I.S., otv. red.;  
MAKAROVA, A., red.; SHAFYEVA, K.A., red.; GOR'KOVAYA,  
Z.P., tekhn. red.

[Generalized Lie series and their application] Obob-  
shchennye riady Li i ikh prilozhenia. Tashkent, Izd-vo  
AN Uzb.SSR, 1963. 105 p. (MIRA 16:7)

(Series)

ARZHANYKH, I.S., otv. red.; SHAFEYeva, K.A., red.; MAKAROVA, A.A.,  
red.; KARABAYeva, Kh.U., tekhn. red.

[Studies on differential equations] Issledovaniia po dif-  
ferentsial'nym uravneniiam. Tashkent, Izd-vo AN Uzb.SSR,  
1963. 204 p. (MIRA 16:11)

1. Akademiya nauk Uzbekskoy SSR. Tashkent. Institut mate-  
matiki. 2. Chlen-korrespondent AN Uzb.SSR (for Arzhanykh).  
(Differential equations)



GRINEVICH, G.A.; GARTSMAN, L.B.; RAKHIMOV, Kh.; PETELINA, N.A.;  
FAZYLOV, Kh.F., akademik, otv. red.; SHAFEYEV, K.A.,  
red.; SOKOLOVA, A.A., red.; KARABAYEVA, Kh.U., tekhn.  
red.

[Study of the characteristics of regenerative power sources;  
wind, water, and solar energy] Issledovaniia kharakteristik  
rezhima vozobnovliaiushchikhsia istochnikov energii vody,  
vetra i solntsa. Tashkent, 1963. 205 p. (MIRA 16:8)

1. Akademiya nauk Uzbekskoy SSR, Tashkent. Institut energetiki i avtomatiki. 2. AN UzSSR (for Fazylov).  
(Power resources)

LAVROV, N.V., akademik, otv. red.; BAKLITSKAYA, A.V., red.; EYDEL'MAN  
A.S., red.; SHAFEYeva, K.A., red.; KARABAYEVA, Kh.U.,  
tekhn. red.

[Materials of the Republic Conference on the Development  
of the Gas Industry of Uzbekistan] Materialy Respublikanskoy  
konferentsii po gazifikatsii Uzbekistana, Tashkent, Izd-vo  
AN UzSSR, 1963. 291 p. (MIRA 16:8)

1. Respublikanskaya konferentsiya po gazifikatsii Uzbekistana,  
Tashkent, 1961. 2. Akademiya nauk UzSSR (for Lavrov).  
(Uzbekistan--Gas, Natural)

L 36350-66 EWT(1)/T IJP(c) AT

ACC NR: AF6017583

(A)

SOURCE CODE: UR/0377/65/000/006/0039/0041

AUTHOR: Shafeyeva, K.

ORG: none

TITLE: All union conference on the use of solar energy

SOURCE: Geliotekhnika, no. 6, 1965, 39-41

TOPIC TAGS: scientific conference, solar energy conversion, solar furnace, solar power plant

ABSTRACT: An all-union conference on the use of solar energy was held in Ashkhabad from 27 through 30 October 1965. It was organized by the Academy of Sciences of the Turkmenian SSR, with participation by the Power Engineering Institute im. G. M. Krzhizhanovskiy, Moscow State University, Institute of Plant Physiology AN SSSR, Physicotechnical Institute AN UzSSR, All Union Scientific Research Institute of Current Sources and its Armenian base laboratory, Physicotechnical Institute AN Turkmenian SSR, State Optical Institute, and Academy of Sciences AzSSR. 92 papers were delivered on photosynthesis, photochemistry, solar climate and radiation measurement, concentration of solar radiation and solar furnaces, direct transformation of solar energy into electricity, solar water purifiers, refrigerators, and other heat-power installations. At the plenary session, V. A. Baum (Ashkhabad) reviewed the main trends of research in the use of solar energy, A. A. Shakhov (Moscow) discussed the status and prospects of the use of concentrated solar light in biology and agriculture, with special emphasis

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on pulsed irradiation of biological objects by concentrated light. A. P. Landsman (Moscow) discussed conversion of solar radiation into electricity with the aid of photoelectric, thermoelectric, and thermionic devices, and V. B. Veynberg (Leningrad) reviewed work on concentrators and receivers of solar energy. The photosynthesis and photochemistry section heard papers on the estimate of solar radiation in biologically suspended units, on the character of variation of the temperature in a solar heater for around-the-clock action, and method of calculation of the coefficient of thermal adaptation of ground accumulator of a hot house. The section on solar climate and irradiation measurement considered questions of utilization of solar energy in the Azerbaydzan SSR, procedure for measuring solar radiation using silicon photocells, automatic tracking apparatus for spectral measurements of radiation of the sun at 1 - 6  $\mu$ , some features of the ultraviolet radiation regime in the USSR, resources of erythemic radiation B and A and the bactericidal radiation of the sun and the sky in different zones of the USSR, the climate of Turkmenia from the point of view of the use of solar energy for cooling and heating, and an instrument for the measurement of solar irradiation under field conditions. The section on the concentration of the solar radiation and solar furnaces dealt with optical parameters of film-facet concentrators of solar rays, various properties and materials of concentrators, permissible pressures, and air currents in such concentrators, methods of welding, cutting, and melting materials in the focus of a solar furnace. Most papers were heard by the section on the concentration of solar radiation and solar furnaces, and dealt with the materials, preparation, and operating conditions of the furnaces, as well as with methods of

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welding, cutting, and melting materials in their focus. The section on direct conversion of solar energy into electricity dealt with the measurement of their thermoelectric parameters, construction of a solar thermionic generator with different-height thermocouples, and solar energy installations with photoelectric converters. Test results of various installations were presented and ways of increasing their efficiency were discussed. The section on solar water purifiers, refrigerators, and other installations heard papers on solar generators for heating and cooling devices, for heat accumulators, water purifiers, and others. The complete text of the papers will be published in the journal "Geliotekhnika."

SUB CODE: 03, 09 SUBM DATE: 00

05

Card 3/3 H S

BUTOVSKAYA, Ye.M.; ZAKHAROVA, A.I.; IOBKO, V.K.; FLENOVA, M.G.;  
FLENOV, Yu.P.; KYZHIKOV, O.A., doktor geol.-miner. nauk,  
otv. red.; SHAPEYEVA, K.A., red.

[Seismicity of Uzbekistan] Seismichnost' Uzbekistana.  
[by] E.M.Butovskaia i dr. Tashkent, Izd-vo "Nauka,"  
UzSSR. No.2. [Tashkent and Yuzhnyy seismic regions, the  
central part of the Chatkal Range] Pritashkentskii i  
Iuzhnyi seismicheskie raiony, tsentral'naya chast' Chatkal'-  
skogo khrebt. 1964. 121 p. (MIRA 17:6)

SHAFYEVA, M.G.

deceased  
c1960

1962/4

SEE ILC



LANIN, S., inzhener; SHAFEE, N.

Centering the front suspension crankshaft of the Moskvich truck.  
Avt.transp. 33 no.12:19 D '55. (MLRA 9:3)  
(Motortrucks--Repairing)

SHAFIBEKOV, A.B.

USSR/Cultivated Plants - General Problems.

L-1

Abs Jour : Ref Zhur - Biologiya, No 16, 1957, 69166

Author : Shafibekov, A.B.

Inst :

Title : A Simple Method of Determining the Amount of Grass Roots in the Soil.

Orig Pub : Sots. s. kh. Azerbaidzhana, 1956, No 11, 64

Abst : A sample of soil (monolith) is placed in a bath, into which water enters from one end and is poured off together with silt and rising roots through a trough on a sieve with openings of 0.25 mm. The soil continually mixes with water. At the end of the washing the remaining earth in the bath is removed, and the roots from the sieve are carried over to the bath and again washed free of silt. The operation is repeated several times in the course of 1-1½ hours.

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SHAFFERT, V.A.

Screw clamp for drilling samples in chemical analysis. Zav.lab 26  
no.10:1177 '60. (MIRA 13:10)

1. Novobirskiy eksperimental'nyy zavod Giprouglenash.  
(Drilling and boring machinery)

SOV/3-59-5-7/34

22(1)

AUTHOR: Shafibekov, A.B., Candidate of Agricultural Sciences, Docent

TITLE: Our Readers Suggest

PERIODICAL: Vestnik vysshey shkoly, 1959, Nr 5, pp 29-30 (USSR)

ABSTRACT: In recent years the number of students who are trained by correspondence increases rapidly. Yet the correspondence departments continue to occupy a position of secondary importance in the vuzes. As an example the author quotes the Azerbaydzhan Agricultural Institute. It possesses 5 day-time departments of which each has 5 specialties. The departments are headed by deans who are highly skilled and experienced specialists. But none of them has so far taken any interest in the work of the correspondence department, the deanery of which has been reduced to a technical apparatus. None of its staff attends the training-methodological

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work. The author suggests that the correspondence department be wound up and its work in respect to the specialties agriculture, live-stock experts and agricultural mechanization be transferred to the deans of the day-time departments.

ASSOCIATION: Azerbaydzhanskiy sel'skokhozyaystvennyy institut  
(Azerbaydzhani Agricultural Institute)

Card 2/2

SHAFIGOV, G.F.

SOV/93-58-10-17/19

11(0)

AUTHOR: Samgullin, A.

TITLE: A Valuable Book on the Economics of Drilling (Tsennaya kniga po ekonomike bureniya)

PERIODICAL: Neftyanoye khozyaystvo, 1958, Nr 10, pp 70-71 (USSR)

ABSTRACT: This is a review of the book "Rezervy snizheniya stoimosti burovnykh rabot" (Possibilities of Reducing the Cost of Drilling Operations) written by G.F. Shafigov, D.Sh. Davletbayev, and V.F. Shmatov and published by Gostop-tekhnizdat in 1958. The authors obtained their data from the Tuymazaburneft Trust which carries out over 50 percent of the drilling work in the Bashkir ASSR.

Card 1/1

FRIST, A.V., AND SHAFIGULIN, A.G.

"Problems in the Chain Theory of Processes of Spontaneous Combustion."  
Vestnik Moskovskogo Universiteta (Seriya Fiziko-matematicheskikh i Yestestvennykh Nauk,  
no. 6), no.9, 1949

SHAFICULLIN, A. G.

AND Skobelkin, V. I. authors of a- Review & Summary of

"Theory of Chain Processes" by N.S. Akulov; State Pub. House of Tech. & Theoret.  
Lit., Moscow, 1951.

Zhur Fiz Khim, Vol XXVII, #1 pp 151-2

W-30868, 18 Aug 54



CHAYTOULLIS, A. G. and SKOBELEKIN, V. I.

"N. S. AKULOV's Theory of Chain Processes," Zhurnal Fizicheskoy Khimii, Vol 27,  
No 1, pp 151-2, 1953

Summary W-30868, 18 Aug 54

SHAFIULLIN, A.G.

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USSR .

✓ Study of kinetics of oxidation of oxalic acid by permanganate by the method of absorption spectra. A. G. Shafullin. (V. I. Ul'yanov-Lenin State Univ., Kazan). *Zhur. Fiz. Khim.* 27, 1351-61 (1953); *Ch. Uchenye Zapiski Kazan. Gosudarst. Univ.* 111, No. 3 (1951). -- The course of the reaction between  $\text{KMnO}_4$  and  $\text{H}_2\text{C}_2\text{O}_4$  at  $15^\circ$  was observed spectrographically; 20 absorption spectra were photographed (exposure 5 sec. each) during a 25 min. interval of each of 2 solns. made from 15 and 30%  $0.1N \text{KMnO}_4$  in which the remainder was  $0.1N \text{H}_2\text{C}_2\text{O}_4$  slightly acidified with  $\text{H}_2\text{SO}_4$ . The induction periods were 12 and 8 mins., resp. The transparency of the spectrograms is plotted as a function of time for several wave lengths between 3650 and 6230 Å. The concns. of septi- and trivalent Mn and the reaction rate were calcd. by a described method from the spectrographic data. This reaction exhibits chain-type self-acceleration. During the induction period  $\text{MnO}_2$  is formed; this is reduced to a lower oxide which reacts in turn with permanganate.  
J. W. Loweberg, Jr.

MA JWH

SHAFIGULLIN, A.G.

Photoelectric method of investigation of the temperature dependence of the oxidation of oxalic acid by potassium permanganate. — A. G. Shafigullin (V. I. Ul'yanov-Lenin State Univ., Kazan). *Zhur. Fiz. Khim.* 27, 1767-75 (1953). — The oxidation of  $H_2C_2O_4$  by  $KMnO_4$  was studied by means of an illustrated photoelec. bridge. Galvanometer deflections were plotted as functions of time for several concns. of  $KMnO_4$  at temps. of 5, 10, and 15°. Quadrivalent Mn is formed in this reaction simultaneously with trivalent Mn. A math. discussion of the reaction kinetics is given.  
J. W. Loweberg, Jr.

8/24/19/34

SHAFIGULLIN, A. G.

✓ Possibility of the application of interference phenomena in the Toepler apparatus for quantitative investigations. S. A. Abrukov and A. G. Shafigullin. *Zhur. Tekh. Fiz.* 25, 421-4 (1965). — Although the interference phenomena in Maksutov's modification (*Izgotovlenie i ispolzovanie astronomicheskoi optiki*, Leningrad-Moscow, 1948) of the mirror-meniscus Toepler app. still require a stricter interpretation in terms of modern light theory, they can nevertheless be used to determine empirically and quantitatively the optical heterogeneities and the distribution of  $n$  in the heterogeneities. The interference method yields results in good agreement with those obtained by the original Toepler method. Exptl. data for  $\text{CO}_2$  gas in air and for an alc. flame are given. F. H. R.

Phy  
Chem

Row

SHAFIGULIN, A.G., doktor tekhn.nauk, prof.

The 250th anniversary of M.V.Lomonosov's birth. Izv.vys ucheb.zav.;  
 mashinostr. no.11:200-206 '61. (MIRA 14:12)

1. Moskovskoye vyssheye tekhnicheskoye uchilishche im. N.E.Baumana.  
 (Lomonosov, Mikhail Vasil'evich, 1711-1765)

SHAFIGULLIN, M

SHAFIGULLIN, M.

Problem that must be solved without delay. Sots. trud no.12:136 D '57.  
(MIRA 11:1)

1. Starshiy bukhgalter Urmanayevskogo mezhrayonnogo molokozavoda  
Tatarskogo tresta "Rosglavmoloko".  
(Dairying--Production standards)

ACC NR: AP7002734 (A)

SOURCE CODE: UR/0126/66/022/006/0839/0842

AUTHOR: Shafigullina, G. A.; Chechernikov, V. I.; Markova, I. A.

ORG: Moscow State University im. M. V. Lomonosov (Moskovskiy gosuniversitet)

TITLE: Magnetic properties of Dy-Y alloys

SOURCE: Fizika metallov i metallovedeniye, v. 22, no. 6, 1966, 839-842

TOPIC TAGS: dysprosium compound, yttrium compound, magnetic property, magnetic susceptibility, Curie point, magnetic moment

ABSTRACT: The article presents the results of an experimental investigation of magnetic properties of Dy-Y alloys throughout the range of concentrations in the temperature interval of from 100 to 1000°K in the presence of magnetic fields of various intensity. To this end, 9 alloys of this system, containing 5.7, 11.9, 18.7, 26.6, 35, 44.8, 55.8, 68 and 83 at. % Dy (with Y as the remainder) were obtained by multiple remelting in a helium-atmosphere arc furnace and vacuum annealing at  $10^{-6}$  mm Hg for 70 hr at 850°C. Magnetic susceptibility was measured by the conventional ponderomotive method on using a magnetic balance. Heating to high temperatures was accomplished with the aid of a platinum resistance furnace, and the temperature

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UDC: 669.85/86:538.214

ACC NR: AP7002734

was measured by means of precalibrated Pt-PtRh and Cu-constantan thermocouples. The quartz cup containing the specimen and the thermocouple junction were in a uniform temperature field. The magnetic balance was calibrated in advance with respect to pure holmium (for  $< 700^\circ\text{K}$ ) and nickel (for  $700-1100^\circ\text{K}$ ). Findings: magnetic susceptibility  $\chi$  and crystal lattice constants  $a$  and  $c$  change monotonically over the entire concentration range (Fig. 1). The pattern of temperature dependence of reverse susceptibility  $1/\chi$  is linear, (Figs. 2, 3) thus making

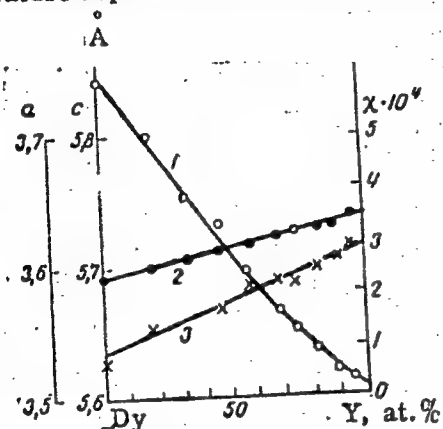


Fig. 1. Magnetic susceptibility  $\chi$  (curve 1) and lattice constants  $a$  (curve 2) and  $c$  (curve 3) as functions of composition of the Dy-Y alloy at room temperature

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ACC NR: AP7002734

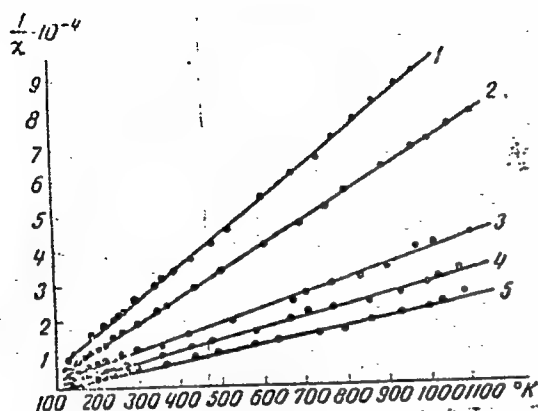


Fig. 2. Temperature dependence of reverse susceptibility of Dy-Y alloys:  
1 - 5.7 at. % Dy; 2 - 11.9 at. % Dy; 3 - 18.7 at. % Dy; 4 - 26.6 at. % Dy; 5 - 35 at. % Dy. (Remainder: Y)

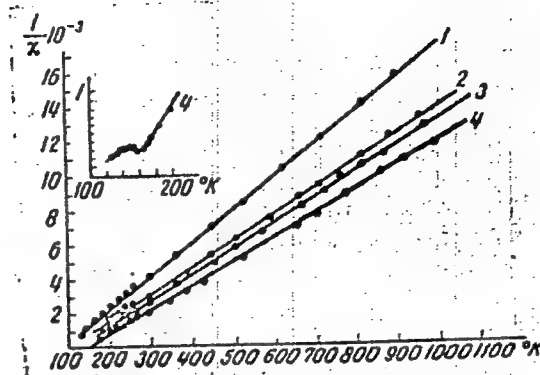


Fig. 3. Temperature dependence of reverse susceptibility of Dy-Y alloys:  
1 - 44.8 at. % Dy; 2 - 68 at. % Dy; 3 - 83 at. % Dy (Remainder: Y)

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ACC NR: AP7002734

it possible to calculate the effective atomic magnetic moment  $p_p$  of the alloys as well as to determine the paramagnetic Curie point  $\theta_p$  (Fig. 4). Within the investigated temperature range

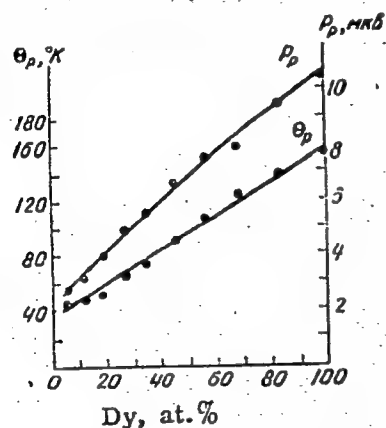


Fig. 4. Effective atomic magnetic moment  $p_p$  and paramagnetic Curie point  $\theta_p$  as functions of alloy composition

the magnetic susceptibility of Dy-Y alloys follows the Curie-Weiss law.  $p_p$  and  $\theta_p$  of the alloys

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ACC NR: A17002734

vary monotonically as a function of the alloy composition, and the magnetic moment calculated per atom of dysprosium corresponds to the trivalent ion of this element in fundamental state. In the low temperature range there occurs a transition from antiferromagnetic to paramagnetic state, which shifts in the direction of low temperatures with increase in the magnetic field intensity (Fig. 5). All this indicates that the magnetic properties of Dy-Y alloys are chiefly

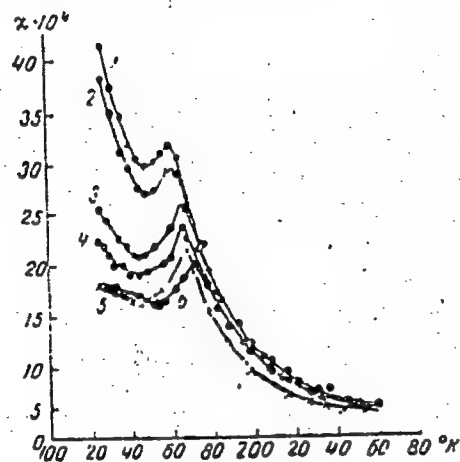


Fig. 5. Temperature dependence of susceptibility of alloy no. 9 (83 at. % Dy, remainder Y) as a function of magnetic field intensity H:

1 - 17,400 oe; 2 - 16,100 oe; 3 - 14,600 oe;  
4 - 12,440 oe; 5 - 10,050 oe; 6 - 7,550 oe

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ACC NR: AP7002734

conditioned by localized 4f-electrons, while in the antiferromagnetism region there apparently exists a spiral-like magnetic structure resembling the structure observed for pure dysprosium. "In conclusion the authors wish to express their gratitude to Professor Ye. I. Kondorskiy for his valuable comments." Orig. art. has: 5 figures.

SUB CODE: 11, 20/ SUBM DATE: 29Mar66/ OTH REF: 004

Card 6/6

SHIKHOV, Vladimir Vasil'yevich; SHAFIKOV, G., kand.ekonom.nauk, red.;  
KAMENEV, N.P., red.; GAL'CHENKO, S.I., tekhn.red.

[Ways of increasing labor productivity in industrial enterprises]  
Puti povysheniia proizvoditel'nosti truda na promyshlennom pred-  
priatii (na primere sodovoi promyshlennosti). Pod red. G.Sha-  
fikova. Ufa, Bashkirskae knizhnoe izd-vo, 1958. 108 p.  
(MIRA 12:7)

(Soda industry--Labor productivity)

SHAFIKOV, G.F.

USSR/Agriculture - Conferences

Card 1/1      Pub. 124 - 22/32

Authors      : Shafikov, G. F., Cand. of Econ. Sc.

Title        : Aid of scientists to agriculture

Periodical   : Vest. AN SSSR 25/6, 99-100, June 1955

Abstract     : Brief report is presented on the activities of the scientific conference held at the Bashkir branch of the Academy of Sciences, USSR (city Baymak, March 4-5, 1955), where the importance of scientific aid to agriculture was explained.

Institution : .....

Submitted   : .....

KOL'CHIK, A., Geory Sotsialisticheskogo Truda; SHAFIKOV, Kh.;  
KOLESOV, O.; POYMANOV, D.

The program of the party is the people's banner. Sov.shakht.  
10 no.9:4-5 S '61. (MIRA 14:8)

1. Brigadir shakhty imeni Lutugina tresta Chistyakovantratsit  
(for Kol'chik). 2. Rukovoditel' kombaynovoy brigady uchastka  
kommunisticheskogo truda shakhty No.37 kombinata Karagandaul'  
(for Shafikov). 3. Nachal'nik shakhty kommunisticheskogo  
truda "Kommunist-Novaya" v Donbasse (for Kolesov). 4. Zamestitel'  
sekretarya partorganizatsii shakhty No.29 kombinata Vorkutugol'  
(for Poymanov).

(Coal mines and mining—Labor productivity)

NAUMOVA, I.B.; BELOZERSKIY, A.N.; SHAFIKOVA, F.A.

Isolation and some properties of teichoic acid from *Actinomyces streptomycini* Krass. Dokl. AN SSSR 143 no.3:730-733 Mr '62.  
(MIRA 15:3)

1. Chlen-korrespondent AN SSSR (for Belozerskiy).  
(ACTINOMYCES)(TEICHOIC ACIDS)



118

NEW APPARATUS FOR BACTERIOLOGICAL INVESTIGATION OF AIR.  
 L. Shahr, *Soviet. Trakhsnyi Zhur.* 43, 129-34 (1941);  
*Chem. Zentr.* 1943, I, 657. — The new app., based on the  
 centrifuge principle, is simpler, lighter and easier to handle  
 than the Wells app. (*C. A.* 29, 7713; 30, 5077). Ac-  
 curacy is rather high. Marion Horn Peskin

ASD. SLA METALLURGICAL LITERATURE CLASSIFICATION

454. ELECTROSTATIC AIR FILTER. Sharif, A. I. (Hygiene et Serv. Sanitaire (Moscow), 1945, No.6, 1-9).

The author has designed an electrostatic filter for rooms which is claimed to reduce the bacterial population of the air by 99.9 per cent. It is described as a cylinder, 70 cm. long, to which a potential of 14-35 Kv. is applied. An ultra-violet lamp for air sterilisation is also mentioned. It gives 34 per cent. of its radiation at 2,800A, and can sterilise 40-50 cubic metres of air in 15 minutes. The air is blown against the lamp by means of fans.

SHAFIR, A. I.

PA 65T67

USSR/Medicine - Surgery  
Medicine - Air

Apr 1948

"Air Supply During Surgical Operations and Measures  
for Improvement," Prof A. I. Shafir, Docent P. A.  
Kouzov, Chair of Gen Hygiene, Mil Med Acad, 6 pp

"Gig 1 San" No 4

Result of studies conducted in two large operation-  
theater blocks to determine the purity of air. Sug-  
gests various measures adopted to further purify air  
being supplied.

65T67

SHAFIR, A. I.

37623

aerogennye infektsionnye zabolevaniya i metody ikh preduprezhdeniya.  
v ogl: a. n. (!) shafir v sb: XII vaesoyuz syezo gigienistov,  
epidemiologov, mikrobiologov i infektsionistov. T. I. M., 1949, s 110-13.

SO: Letopis' Zhurnal'nykh Sstatey, Vol. 37-1949

ANDREYEVA-GALANINA, Ye. TS.;  
SHAFIR, A. I.

Atmosphere

Hygiene of atmospheric air,  
Reviewed by V. A. Ryazanov,  
Gig. i san, No. 12, 1951.

Monthly List of Russian Accessions, Library of Congress,  
March, 1952. UNCLASSIFIED.

✓ 1050. PAPER FILTERS FOR CLEANING VENTILATING AIR FROM MICRO-ORGANISMS  
AND DUST. Shafir, A.I., Koltov, P.A. and Panshinskaya, N.M. (U.S.S.R.)  
Sanit. (Hyg. & Sanit., Moscow), Sept. 1953, 23-27).

SHAFIR, A.I.; KOUZOV, P.A.; PANSHINSKAYA, N.M.

Paper filters for the purification of ventilation air from microorganisms  
and dust. Gig.i san. no.9:23-28 S '53. (MLA 6:8)  
(Air filters)

SHAFIR, A.I.

"Maximum allowable concentrations of atmospheric pollution."  
Reviewed by A.I.Shafir. Gig.1 san.no.2:59-60 P '54. (MLRA 7:2)  
(Air--Pollution)



**Excerpta Medica 1/5 sec 17 May 55 Pub. Health, Social Medicine & etc.**

2113. SHAFIR A.I., DARMANTCHEVA M.S. and SOLOMONOVA E.I. Sci. exp. sanitary hyg. Inst. of Leningrad. \* Hygienic foundation of the standard height of living rooms in a temperate climate (Russian text) GIGIENA 1954, 3 (17-23) Graphs 1 Illus. 2

The optimal height for a standard living room is estimated by means of experiments as 3.5 m. Only under these conditions are normal physiological reactions of inhabitants guaranteed and chemical and bacteriological conditions optimal. The proportions of height, length and breadth of dwelling rooms are of considerable importance. Further investigations under other climatic conditions should be made.

Jettmar - Graz

SHAFIR, A.I.

## USSR .

3361 AERE-Lib/Trans-481

PAPER FILTERS FOR THE REMOVAL OF MICRO-ORGANISMS AND DUST FROM VENTILATING AIR. A. I. Shafr, P. A. Kouzov, and N. M. Panshinskaya. Translated by J. D. Sykes from Gigiena i Sanit. No. 9, 23-9(1954).

Lignin paper filters were found to give excellent results as a means of sterilizing the air of inhabited rooms. The filters are recommended for use in ventilating systems for the purpose of purifying the air from dust and micro-organisms. Impregnation with emulsions of the outer layers of the lignin filters was found to increase the dust-retaining power of the filters. (C.H.)

SHAFIR, A.I.; NIKITIN, M.Ya.; LEUSHIN, P.I.

Fitted case of instruments used for sanitary examination of living quarters in the praxis of a sanitary physician. Gig. i san. no.11: 40-43 N '54. (MIRA 7:12)

1. Iz Leningradskogo nauchno-issledovatel'skogo sanitarno-gigiyenicheskogo instituta.

(SOCIAL HYGIENE

exam. of living quarters, carrying case for instruments)

(APPARATUS AND INSTRUMENTS

instruments for sanit. exam. of living quarters, carrying case)

SHAPIR, Avraam Isaakovich; professor; LILENKO, S.I., redaktor; KHARASH, G.A.  
tekhnicheskii redaktor.

[Sanitation for dwellings] Gigiena zhilishcha. Leningrad. Gos.izd-vo  
med.lit-ry, Leningradskoe otd-nie, 1956. 57 p. (MLRA 9:6)  
(Sanitation, Household)

SHAFIR, A. I.

"Hygienic Norms and Requirements Made on Modern Housing Construction,"  
paper presented at the Scientific Conference of the Leningrad Sanitation Institute,  
8-10 May 1956.

U-3,054,017

SHAFIR, A.I.

"The highest permissible contamination of the atmosphere." V.A.  
Riazanov. Reviewed by A.I. Shafir. Qig. 1 san. 21 no.1:59-60 Ja. '56.  
(MIRA 9:5)

(AIR--POLLUTION) (RIAZANOV, V.A.)

SHAFIR, A.I., professor

Garments and bedclothes as factors of microbe and dust pollution  
of air in buildings. Gig. i san. 21 no.9:19-26 S '56. (MLRA 9:10)

1. Iz Leningradskogo nauchno-issledovatel'skogo sanitarno-  
gigiyenicheskogo instituta.

(DUST, determ.

in air, microbiol pollution of dust particles from  
clothes & bedding)

(BACTERIA

same)

(AIR POLLUTION

bact. on dust particles from bedding & clothes)

SHAFIR, A.I.

SHAFIR, A.I., professor; APNSHINSKAYA, N.M., nauchnyy sotrudnik;  
SOLOMONOVA, Ye.I., nauchnyy sotrudnik

Hygienic rating of various types of ventilation in apartment houses  
[with summary in English]. Gig. i san. 22 no.1:18-25 Ja '57.  
(MLRA 10:2)

1. Iz Leningradskogo nauchno-issledovatel'skogo sanitarno-gigiyeni-  
cheskogo instituta.

(VENTILATION

hyg. characteristics of various types in dwellings (Rus))



SHAFIR, A.I., prof.; PANSHINSKAYA, N.M.; SMITSKIY, A.A., prof.; AVER'YANOVA,  
A.V.; KOUZOV, P.A., kand.tekhnicheskikh nauk

Using paper filters for eliminating viruses from the air of ventilated  
rooms [with summary in English]. Gig. i san. 22 no.9:3-9 S '57.  
(MIRA 10:12)

1. Iz Leningradskogo nauchno-issledovatel'skogo sanitarno-gigiyeni-  
cheskogo instituta Leningradskogo nauchno-issledovatel'skogo insti-  
tuta mikrobiologii, epidemiologii i gigiyeny imeni Pastera i Vse-  
soyuznogo instituta okhrany truda Vsesoyuznogo tsentral'nogo soveta  
profsoyuzov v Leningrade.

(AIR POLLUTION

viruses, exper. use of filter paper for purification)

(VIRUSES

in air, exper. filtration purification with filter paper.

GALANIN, N.; AGEYEV, P.; IOFFE, M.; KYUPAR, A.; RAMM, I.; SHAFIR, A.

Using sewage for field irrigation. Gig. i san. 22 no.9:73-74 S '57.  
(MIRA 10:12)

1. Predsedatel' pravleniya Leningradskogo otdeleniya Vserossiyskogo  
obshchestva gigiyenistov (for Galanin). 2. Chleny pravleniya  
Leningradskogo otdeleniya Vserossiyskogo obshchestva gigiyenistov  
(for Ageyev, Ioffe, Kyupar, Ramm, Shafir)

(SEWAGE

utilization for irrigation of fields)

(IRRIGATION

utilization of sewage)

GOROMOSOV, M.S., kand.med.nauk; SHAFIR, A.I., prof.

Soviet residential hygiene; 40th anniversary of the Great October  
Socialist Revolution. Gig. i san. 22 no.10:26-32 '57. (MIRA 10:12)

(HOUSING

in Russia, progr. in sanitation & hygienic aspects)

(SANITATION,

in housing develop. in Russia, progr.)

SHAFER, A. I.

"Hygienic Standardization of Residential Construction in  
Connection with the Problems of Prevention of Airborne  
and Intestinal Infections."

report submitted at the 13th All-Union Congress of Hygienists, Epidemiologists  
and Infectionists, 1959.

SHAFIR, A.I., prof.

Some problems in methods of sanitary microbiological studies on  
the air of living quarters. Gig.i san. 24 no.11:7-12 N '59. (MIRA 13:4)

1. Iz Instituta radiatsionnoy gigiyeny Ministerstva zdravookhra-  
neniya RSFSR.  
(AIR microbiology)

VAYNSHTEYN, P.R., kand.biologicheskikh nauk; LEUSHIN, P.I., kand.tekhn.nauk;  
SHAFIR, A.I., doktor med.nauk

Physiohygienic principles of permissible levels of noise intensity  
in multistory apartment houses. Gig. i san. 25 no.3:23-29 Mr '60.  
(MIRA 14:5)

1. Iz Instituta radiatsionnoy gigiyeny Ministerstva zdavookhraneniya  
RSFSR.

(NOISE)

(APARTMENT HOUSES--SANITATION)

SHAFIR, A.I., prof.

Dwellings as objects of radiation-hygienic studies. Gig. i san. 26  
no.6:14-21 Je '61. (MIRA 15:5)

1. Iz Instituta radiatsionnoy gigiyeny Ministerstva zdavookhraneniya  
RSFSR.

(RADIATION PROTECTION) (HOUSING--HYGIENIC ASPECTS)

GOROMOSOV, M.S., doktor med. nauk; DANTSIG, N.M., prof.; KYUPAR, A.I., sanit. vrach; MINKH, A.A., prof.; PROKOF'YEV, A.P., dots.; SILIVANIK, K.Ye., doktor med. nauk [deceased]; UVAROV, M.M., kand. med. nauk; SHAFIR, A.I., prof.; SHTREYS, A.I., prof.; KROTKOV, F.G., prof., otv. red.; SELESKERIDI, I.G., red.; ROMANOVA, Z.A., tekhn. red.; MIRONOVA, A.M., tekhn. red.

[Manual on communal hygiene] Rukovodstvo po kommunal'noi gigiene. Moskva, Medgiz. Vol.3. [Hygiene of residential and public buildings] Gigiena zhilykh i obshchestvennykh zdaniy. Red. toma Goromosov i A.I. Shafir. 1963. 486 p. (MIRA 17:2)

1. Deystvitel'nyy chlen AMN SSSR (for Krotkov). 2. Chlen-korrespondent AMN SSSR (for Minkh).





SHAFIR, A.I., prof. (Leningrad)

The air we breath. Zdorov'e 9 no.1:27-28 Ja '63. (MIRA 16:7)  
(VENTILATION)

SHAFIR, A.I., prof.

Problems of communal hygiene at the Ninth Scientific and  
Practical Conference of the Public Health Physicians of  
Leningrad, Dec. 26-27, 1962. Gig. i san. 28 no.7:101-102  
Jl '63. (MIRA 17:1)

SHAFIR, G. A.

✓ 4319. EFFECT OF PRESSURE ON LOW TEMPERATURE CARBONIZATION OF SOLID FUELS. I. Chernyshev A.B., Afreshuler V.S. and Shafir G.A. Izv. Akad. Nauk SSSR Otdel. Tekh. Nauk (Bull. Acad. Sci. U.S.S.R. Div. Tech. Sci.), Oct. 1955, 1393-1400; Dokl. Akad. Nauk SSSR (Proc. Acad. Sci. U.S.S.R.), 1 Jan. 1954, vol. 94, (1), 117-120. Laboratory experiments are recorded in which Baltic shale, Moscow Region and Donetsk coals, and Ukrainian brown coal, were heated in a retort at 550-630°C and 20-100 atm. while products were removed in a stream of nitrogen. Decomposition of the fuel was shown to depend on temperature, not pressure. Pressure affected secondary reactions in the vapour/gas phase, directly by assisting polymerization and condensation, and indirectly by increasing the time the products remained in the apparatus. With time in apparatus constant, increased pressure decreased the yield of unsaturated compounds and light tar fractions, and increased that of asphaltenes and carboids. Increase of time led to increase in yield of semicoke and gas, decrease in tar, increase of light fractions and neutral compounds and decrease of phenols in the tar, and decrease of unsaturated compounds, and increase of methane and its homologues, in the gas. (L).

CHERNYSHEV, A.B.; AL'TSHULER, V.S.; SHAFIR, G.A.

Effect of pressure on semicoking of solid fuels. Dokl. AN SSSR  
94 no.1:117-120 Ja '54. (MIRA 7:1)

1. Chlen-korrespondent Akademii nauk SSSR. (Coke)

Shafir, G.A.

Nonagglomerated brown-coal gasification of the Ukrain. S.S.S.R. with a steam-oxygen blast under pressure and under laboratory conditions. A. B. Chernyshev, V. I. Tolubinskii, V. S. Al'tshuler, M. I. Rabinovich, G. A. Shafir, and G. N. Khopta. *Akad. Nauk Ukr. S.S.R., Inst. Teploenerget., Sbornik Trudov* 1955, No. 11, 81-93.—Expts. on the gasification of nonagglomerated brown coal at pressures up to 50 atm., with a blast of varying compn., shows that gasification is complete in a short distance of about 400 mm. or 10-12 times the particle size. The proportion of  $CH_4$  and  $CO_2$  in the gas is higher at higher pressures, and, for a given blast compn., the  $CO$  content is lower. Raising the  $H_2O:O$  proportion at a given gas pressure raises the  $CO_2$  and  $H_2$  proportion in the gas and lowers the  $CH_4$  and  $CO$  proportion. The B.t.u. of the gas produced at higher pressure is higher. Increased pressures raise the carbonization share in the gas production. A larger part of the potential heat capacity in the fuel enters the gas in the charring zone, resulting in a lower  $O$  and steam consumption in the total process. When considering the differences in the size of the industrial installations and the higher temp. used, industrial gasification will prove more profitable than can be obtained on a bench scale. W. M. S.

SHAFIR, G. A.

О ПРОЦЕССЕ ГАЗОБРАЗОВАНИЯ  
ПРИ ГАЗИФИКАЦИИ ТВЕРДЫХ ТОПЛИВ  
ПОД ВЫСОКИМ ДАВЛЕНИЕМ

В. С. Ахметзяров, Г. А. Шафир

VIII Mendeleev Congress for General and Applied Chemistry in  
Section of Chemistry and Chemical Technology of Fuels,  
publ. by Acad. Sci. USSR, Moscow 1979

abstracts of reports scheduled to be presented at above mentioned congress,  
Moscow, 19 March 1979.

AL'TSHULER, V.S.; SHAFIR, G.A.

Thermodynamic investigation of the conversion of methane by water  
vapor and carbon dioxide under high pressure. Trudy IGI 11:66-74  
'59. (MIRA 13:6)  
(Methane) (Water vapor) (Carbon dioxide)

USSR.

Thermodynamics of gasification of solid fuels under high pressure. A. B. Chernyshev, V. S. Al'tshuler, and G. S. Shafr. Trudy Inst. Goryuch. Iskopaemykh, Akad. Nauk. S.S.S.R. 3, 86-94 (1954).—C gasification was studied at 1-300 atm. pressure and 300-1100° temp., with various gasification means (steam, steam with O<sub>2</sub>, air, and H<sub>2</sub>). CH<sub>4</sub> is the only detectable hydrocarbon formed when C is gasified at 300 atm. and 1100° under gas-synthesis conditions. High pressure during the gasification of solid fuels increases the proportion of H<sub>2</sub>O, CO, and CH<sub>4</sub>, and H<sub>2</sub>O and CO<sub>2</sub> must be eliminated to raise the B.t.u. of the gas. The effect of high pressure upon C gasification differs with the temp., and good results are obtained at around 700° and 20-30 atm. pressure. The gasification-medium compn. greatly affects the B.t.u. of the gas produced. Higher H<sub>2</sub> and O-contg. components and reduction in the N<sub>2</sub> concn. in the gasification medium raise the B.t.u. considerably. The optimum O<sub>2</sub> concn. in the gas depends on the thermal gasification conditions. The O<sub>2</sub> consumption is lower and steam consumption is higher at higher pressures. Other gaseous hydrocarbons (e.g. C<sub>2</sub>H<sub>6</sub>) may also form in the actual gasification of solid fuels through cracking and hydrogenation of the high-mol. components of the coal.

W. M. Sternberg



34414, 1. 3.

"The Effect of Pressure on the Semiocking of Solid Fuel."  
Coal Tech Sci, Inst of Mineral Fuels, Department of Technical  
Science, Acad Sci USSR, Moscow, 1965. (KL, No 13, Mar 55)

SO: Sum. No. 670, 29 Sep 55-Survey of Scientific and Technical Dis-  
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AL'TSHULER, V.S.: SHAFIR, G.S.

Semicoking of solid fuels in an active gaseous medium under high pressure. Khim. i tekhn. topl. no.10:45-55 O '56.

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1. Institut goryuchikh iskopayemykh Akademii nauk SSSR.  
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AUTHORS: Al'tshuler, V. S. and Shafir, G. S. SOV/65-58-7-1/12

TITLE: Obtaining Gases of Given Composition During the Gasification of Solid Fuels Under High Pressure (Polucheniye gazov zadannogo sostava pri gazifikatsii tverdykh topliv pod vysokim davleniyem).

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ABSTRACT: Gasification under pressure makes it possible to obtain cheap, fine-grained, low-quality fuels. The authors investigated a gas generating process under high pressure to obtain a gas with required proportion of active components and the minimum content of methane. The plant used for these experiments is described (Fig.1). The basic apparatus comprises a cylinder made of stainless steel (height = 800 mm, internal diameter = 150 mm). Inside the cylinder is a stainless steel reactor (length = 500 mm and internal diameter = 50 mm) on which a 11 kw heater is fixed. To achieve better mixing of the reaction gases ( $O_2$ ,  $CH_4$ ,  $CO_2$ ), with the water vapour at the inlet of the reactor tube, a perforated 100 mm high cylinder is used which is filled with 8 - 10 mm pieces of fireclay. During the experiment the temperature of the reaction

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layer is regulated by platinum-platinum-rhodium thermocouples which are placed in the centre of the layer at 15 and 350 mm from the base of the reactor. Two series of experiments were carried out to determine the conditions under which the formation of methane during the gasification of fuels is inhibited: (1) experiments on the gasification of peat semi-coke by using a mixture of  $H_2O:O_2 = 1$ ; 5 and 10 at pressures of 1, 20 and 50 atms; (2) experiments on the processes of interaction of various mixtures of  $CO_2 + H_2O$  ( $CO_2:H_2O = 0.2$ ; 1.0 and 2.0) with peat semi-coke at temperatures of  $750^\circ$  to  $950^\circ C$  and pressures of 1 and 20 atms. Fig.2: variations in the ratio of  $H_2O:CO$  according to the height of the layer during the gasification of peat semi-coke under pressure. Experimental data on the rate of formation of methane - Fig.3 - shows that the rate of formation increases with increasing temperature of the layer and increasing pressure in the apparatus; above  $1300^\circ - 1350^\circ C$  it decreases. The methane content in the gas is considerably lower when the height of the layer decreases. A second series of experiments concern the formation of methane in the zone of reduction

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reactions. Fig.4: the dependence of the methane content in dry gas on the temperature at varying ratios of  $\text{CO}_2:\text{H}_2\text{O}$  and pressures of 1 and 20 atms. An increase in the  $\text{CO}_2:\text{H}_2\text{O}$  ratio leads to a decreased content of methane in the gas and increases in the pressure to an increased methane content. The same applies to increases in temperature; in this case the increase is greater the higher the pressure and the lower the  $\text{CO}_2:\text{H}_2\text{O}$  ratio. These experiments show that the most effective method of inhibiting the formation of methane during the gasification of fuels under pressure lies in changing the composition of the gas mixture entering the zone of reduction reactions. Further investigations concern the thermodynamic and experimental work of the interaction of methane with water vapour under high and under normal pressure in the presence of coal or of a neutral capping. Thermodynamic calculations of the reaction equilibrium of  $\text{CO}_2 + \text{H}_2\text{O}$  were made at pressures of 1, 20 and 40 atms, temperatures of 700 - 1100°C and the ratios of  $\text{H}_2\text{O}:\text{CH}_4 = 1, 5$  and 10 in the presence of carbon or a neutral capping. These tests were for regulating the methane content in the gas produced during the

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gasification of fuels, and aimed at increasing the effectiveness of manufacturing the gas. Data on the degree of conversion of methane with water vapour is given in a table on page 5. The process was carried out at large excess of water vapour. Further experiments were carried out in the presence of capping made from 3 - 5 mm grains of fireclay at 800° - 1100° C, pressures of 1, 10, 20 and 40 atms and ratios of  $H_2O:CH_4$  of 1, 5 and 10; the rate of movement of the air draught = 0.435; 1.06; 3.45 and 6 m/second. During other experiments the content of nitrogen in the air draught mixture was varied. The height of the layer in all experiments was 500 mm. The degree of conversion of methane at various temperatures and pressures is practically independent of the  $H_2O:CH_4$  ratio i.e. from the concentration of  $CH_4$  in the air draught (Fig.5), which implies that the reaction  $CH_4 + H_2O$  is a first order reaction. Fig.6: the effect of pressure on the degree of conversion of methane at various temperatures. Data on the rate of reaction of  $CH_4 + H_2O$  in the presence of a neutral capping shows that practically total conversion of methane can be achieved e.g. at pressures up to 20 atms and at a tempera-

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ture of the order of  $1100^{\circ}\text{C}$ , the concentration of methane  
in the initial gas does not affect the rate of conversion.  
There are 6 Figures, 1 Table, 5 Soviet References.

ASSOCIATION: IGI AN SSSR.

1. Gas generating systems--Operation
2. Solid fuels--Applications
3. Pressure--Applications
4. Gases--Properties

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<p>Gasomobility technology system 8888 in some significant twenty              years (supplying the Eastern Region of the USSR with gas produced by              Solid Fuel Gasification) Moscow, Gostekhnika, 1979. 218 p. 2,000              copies printed.</p>		
<p>88.1 R.Y. Shashov, Doctor of Technical Sciences; Executive Ed.: T. D.              Shashov; Tech. Ed.: A.V. Trofimov.</p>		
<p>REPORT: This collection of articles is intended for designing, planning,              and scientific research purposes, as well as for engineers, technicians,              and scientific specialists in solid fuel gasification.</p>		
<p>CONTENTS: This collection of articles describes the problems of supplying the              eastern regions of the USSR with synthetic gas derived from the gasification              of solid fuels. The articles are divided into three parts. Individual              articles discuss the development of a solid fuel gasification process, the quality              and types of coal encountered in the eastern region's coal deposits, the quality              of gas produced by gasification, the economic advantages of the process              in the production and supply of the synthetic gas product. The author thanks              V. A. Al'tshuler, Doctor of Technical Sciences, for his assistance in the              article.</p>		
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